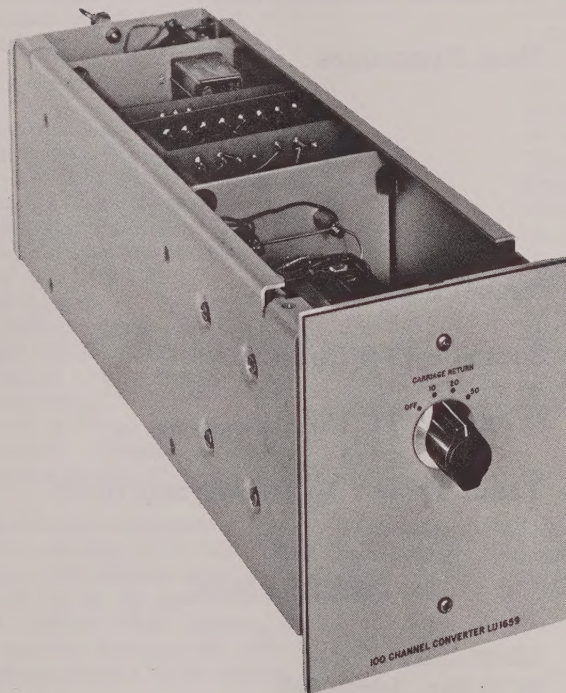


100 CHANNEL CODE CONVERTER LU 1659



MP MASTER



MA24421



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Prelim.

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100 Channel Code Converter

Type LU 1659

SECTION 1

GENERAL

1.1 Introduction

The unit extends the standard 20 channel LY 1470/LY 1471 Compact Loggers to 50/100 channel systems by acting as an interconnecting code converter between the LY 1470/LY 1471 systems and a Scanner type LP 1132.2.

1.2 Specification

Channel Identity Signals : A maximum of 100 signals, generated sequentially by the Scanner LP 1132.2 and identifying channels 00 to 99, are received in decimal form (one-out-of-n code) and are converted to BCD form (8421 code).

Input Levels:-

-10V to signify a decimal input, while all other 9 decade inputs are at common rail potential.

-9V to signify a binary '1' output. Common rail to signify a binary '0' output.

Carriage Return Signals : In a system which uses a typewriter as one of its output devices, a carriage return may be called up at the end of every 10th, 20th or 50th channel, at the end of a Scanner LP 1132.2 cycle and after a TIME recording.

'Final Channel Selected' Output : This output is available for changing the fixed character formats in the Punch Encoder LU 1467 and Addo Punch Drive LU 1718.

Function Outputs : Signals, at -12V and generated sequentially as each channel is sampled, are directed to a system pin board to command operation of other modules in the system. Groups of five outputs are used to energise one column of the pin board.

Offset Supplies : (a) Supplies, generated by the Thermocouple Compensating Unit LU 1468 and the Thermometer Bridge LU 1462 to refer readings to 0°C, are superimposed on the input signal by the

operation of two relays via the system pin board.

(b) Five relays allow up to five Thermocouple Compensating Units LU 1468 to be used in a system.

Distributed Signals

(a) Digitise Command from the Scanner LP 1132.2 to the system A-D Converter and Off Limit Detectors.

(b) System Inputs from the Scanner LP 1132.2 to the system A-D Converter.

(c) Start Scan Command from the Digital Clock LU 1463 to the Scanner LP 1132.2.

(d) Inhibit Scan signal from the Typewriter Drive LU 1469 to the Scanner LP 1132.2 interrupts scanning while automatic carriage return takes place.

(e) A -12V supply is fed to the Relay Units associated with Scanner LP 1132.2, to generate Function Outputs.

Power Requirements : 95V to 130V or 190V to 260V, 50-60c/s. 10VA.

Operating Temperature : 0°C to 50°C ambient.

Dimensions and Weight : 5.25in. high x 4.25in. high x 14in. deep (13cm. x 11cm. x 35.5cm) 4lb. (1.8kg).

SECTION 2

OPERATION

2.1 Installation

The Lower layer/s of the LY 1470/LY 1471 Compact Logger cabinets have been designed to accommodate a number of modules of identical size, one being the 100 Channel Code Converter. The modules slide into the cabinet space frame along lips on their side panels which act as runners. They are retained by rear panel wing nuts. Interlinking connectors, which fit into fixed connectors at the rear of each module, are free on their loom to avoid alignment problems. Certain connectors are retained by straight knurled edge screws which must be released to remove the free mating components.

A Mounting Rack, LU 1472, is available for housing a maximum of four modules of Code Converter dimensions. It is intended for use in multi-layer systems, but can be provided as a separate item.

2.2 Connector Details

(a) Plug PLA

Mains power is applied through fixed plug PLA on the rear panel of the module, the positions of the line, neutral and earth pins being shown in diagram 1. No mains on/off switch is

(b) Socket SKTA

fitted. Power is normally connected by means of the System Voltmeter POWER ON switch.



Mains Input Plug PLA.
Diagram 1.

Table 1. Socket SKTA details.

Note : The LP 1132.2 Scanner accommodates either one or two LP 1243 Relay Units (A and B), providing either 50 or 100 channel capacity.

Pin	Service	Remarks
1	Channels 00, 20, 40, 60, 80	Function Outputs Derived from Relay Units LP 1243. (See cableform for details - Diagram 2) Section 3.2.3 gives alternative arrangements.
2	Channels 01, 21, 41, 61, 81	
3	Channels 02, 22, 42, 62, 82	
4	Channels 03, 23, 43, 63, 83	
5	Channels 04, 24, 44, 64, 84	
6	Channels 05, 25, 45, 65, 85	
7	Channels 06, 26, 46, 66, 86	
8	Channels 07, 27, 47, 67, 87	
9	Channels 08, 28, 48, 68, 88	
10	Channels 09, 29, 49, 69, 89	
11	Channels 10, 30, 50, 70, 90	
12	Channels 11, 31, 51, 71, 91	
13	Channels 12, 32, 52, 72, 92	
14	Channels 13, 33, 53, 73, 93	
15	Channels 14, 34, 54, 74, 94	
16	Channels 15, 35, 55, 75, 95	
17	Channels 16, 36, 56, 76, 96	
18	Channels 17, 37, 57, 77, 97	
19	Channels 18, 38, 58, 78, 98	
20	Channels 19, 39, 59, 79, 99	
21	Channel Identity Decimal Units 1	Derived from Scanner LP 1132.2 (See cable- form for details - Diagram 2).
22	Channel Identity Decimal Units 2	
23	Channel Identity Decimal Units 3	
24	Channel Identity Decimal Units 4	

Table 1 (Cont.)

Pin	Service	Remarks
25	Not Used	
26	Channel Identity Decimal Units 5	Derived from Scanner LP 1132.2 (See cableform for details - Diagram 2).
27	Channel Identity Decimal Units 6	
28	Channel Identity Decimal Units 7	
29	Channel Identity Decimal Units 8	
30	Channel Identity Decimal Units 9	
31	Channel Identity Decimal Tens 1	
32	Channel Identity Decimal Tens 2	
33	Channel Identity Decimal Tens 3	
34	Channel Identity Decimal Tens 4	
35	Channel Identity Decimal Tens 5	
36	Channel Identity Decimal Tens 6	
37	Channel Identity Decimal Tens 7	
38	Channel Identity Decimal Tens 8	
39	Channel Identity Decimal Tens 9	
40	Signal HI	
41	Signal LO	
42	Signal Screening	
43	Digitise Command Signal	
44	-12V	Applied to the LP 1243 Relay Units in the Scanner LP 1132.2
45	Common Rail	
46	End of Scan Signal	Derived from LP 1132.2 Scanner
47	Start Scan Signal	
48	Channel Identity Decimal Tens 00	Derived from Typewriter Drive LU 1469.
49	Inhibit Scan	
50	Not Used	

Table 2. Socket SKTB Connections.

Pin	Signal	Service
A	Output Signal HI	LM 1420 HI Input
B	Output Signal LO	LM 1420 LO Input
C	Output Signal Screening	LM 1420 Guard Input
D	-	Not Used
E	Channel 00, 20, 40, 60, 80	)
F	Channel 01, 21, 41, 61, 81	)
H	Channel 02, 22, 42, 62, 82	)
J	Channel 03, 23, 43, 63, 83	)
K	Channel 04, 24, 44, 64, 84	)
L	Channel 05, 25, 45, 65, 85	)
M	Channel 06, 26, 46, 66, 86	)
N	Channel 07, 27, 47, 67, 87	)
P	Channel 08, 28, 48, 68, 88	)
R	Channel 09, 29, 49, 69, 89	)
S	Channel 10, 30, 50, 70, 90	)
T	Channel 11, 31, 51, 71, 91	)
U	Channel 12, 32, 52, 72, 92	)
V	Channel 13, 33, 53, 73, 93	)
W	Channel 14, 34, 54, 74, 94	)
X	Channel 15, 35, 55, 75, 95	)
Y	Channel 16, 36, 56, 76, 96	)
Z	Channel 17, 37, 57, 77, 97	)
a	Channel 18, 38, 58, 78, 98	)
b	Channel 19, 39, 59, 79, 99	)
c	)	) 2 ²
d	)	)
e	)	)
f	)	)
h	)	)
j	)	)
k	)	)
	Channels 0 to 99 in BCD 8421 code	Channel Identity Signals { 1 ¹
		{ 2 ¹
		{ 4 ¹

/Continued.

Table 2 (Cont.)

Pin	Signal	Service
m	)	)
n	) Channels	) Channel } 8 ¹
	) 0 to 99	) Identity
	) in BCD	) Signals
p	) 8421 code	)
r	)	) } 1 ²
s	)	)
t	) B.O. Volts	LU 1462 Thermometer Unit*
u	) Control of relays	Minimum of 6V required.
v	) RLM and RLN	
w	)	
x	) Digitise Command	To A-D Converter and LU 1464
y	) Signal	Off-Limit Detector
z	) End of Scan	
AA	) Signal	To Recording Equipment
CC	Start Scan Signal	From LU 1469 Typewriter Drive
DD	Start Scan Signal	From LU 1463 Digital Clock x
EE	-	Channel Identity Signal 4 ²
FF	-	Channel Identity Signal 8 ²

* Compact Logger function. Any similar supply may be used in a special system.

x Any similar time source may be used in a special system

(c) Socket SKTC

Table 3. Socket SKTC details

Pins

A and F	Offset Supply from LU 1468 No. 1.
B and H	Offset Supply from LU 1468 No. 2.
C and J	Offset Supply from LU 1468 No. 3.
D and K	Offset Supply from LU 1468 No. 4.
E and L	Offset Supply from LU 1468 No. 5.

2.3 Mains Selector Plug

The Mains Selector Plug (MSP1) is engraved with 115V and 230V markings and should be adjusted so that the metal pointer at the side of the module is opposite to the marking corresponding to the user's mains voltage.

2.4 Mains Fuse

Check that the mains fuse is correctly rated - 1A for 230V supplies and 2A for 115V supplies. The fuseholder is located between MSP1 and PLA at the rear of the module.

2.5 Operating Instructions

If an electric typewriter is used as a system output device, carriage return may be commanded after every 10, 20 or 50 channels have been scanned. Return is achieved according to the setting of the front panel switch. The switch has an OFF position if the facility is not required.

To superimpose an offset supply from a Thermometer Bridge LU 1462 on the signal in-

put to the A-D Converter, energise relay RLF by applying a function output, via the system pin board, to pin v, SKTB. A similar supply from a Thermocouple Compensating Unit LU 1468 is applied by energising pins v and u SKTB to operate relays RLF and RLG. Rows H and J of the system pin board are used to command the LU 1468 Thermocouple Compensating Unit. Row H only is required for LU 1462 Thermometer Bridge control.

FROM		SERVICE	TO		a b
LU 1659	PLA PIN 1	FUNCTION OUTPUTS	LP 1243	PLA PINS 1. 21. 41.	11. 31
LU 1659	PLA PIN 2		LP 1243	PLA PINS 2. 22. 42.	12. 32.
LU 1659	PLA PIN 3		LP 1243	PLA PINS 3. 23. 43.	13. 33
LU 1659	PLA PIN 4		LP 1243	PLA PINS 4. 24. 44.	14. 34
LU 1659	PLA PIN 5		LP 1243	PLA PINS 5. 25. 45.	15. 35
LU 1659	PLA PIN 6		LP 1243	PLA PINS 6. 26. 46.	16. 36
LU 1659	PLA PIN 7		LP 1243	PLA PINS 7. 27. 47.	17. 37
LU 1659	PLA PIN 8		LP 1243	PLA PINS 8. 28. 48.	18. 38
LU 1659	PLA PIN 9		LP 1243	PLA PINS 9. 29. 49.	19. 39
LU 1659	PLA PIN 10		LP 1243	PLA PINS 10. 30. 50.	20. 40
LU 1659	PLA PIN 11	FUNCTION OUTPUTS	LP 1243	PLA PINS 11. 31.	1. 21. 41
LU 1659	PLA PIN 12		LP 1243	PLA PINS 12. 32.	2. 22. 42
LU 1659	PLA PIN 13		LP 1243	PLA PINS 13. 33.	3. 23. 43
LU 1659	PLA PIN 14		LP 1243	PLA PINS 14. 34.	4. 24. 44
LU 1659	PLA PIN 15		LP 1243	PLA PINS 15. 35.	5. 25. 45
LU 1659	PLA PIN 16		LP 1243	PLA PINS 16. 36.	6. 26. 46
LU 1659	PLA PIN 17		LP 1243	PLA PINS 17. 37	7. 27. 47
LU 1659	PLA PIN 18		LP 1243	PLA PINS 18. 38.	8. 28. 48
LU 1659	PLA PIN 19		LP 1243	PLA PINS 19. 39.	9. 29. 49
LU 1659	PLA PIN 20		LP 1243	PLA PINS 20. 40.	10. 30. 50
LU 1659	PLA PIN 21	CHANNEL IDENTITY 1	LP 1132.2	PLE PIN A1	
LU 1659	PLA PIN 22	CHANNEL IDENTITY 2	LP 1132.2	PLE PIN A2	
LU 1659	PLA PIN 23	CHANNEL IDENTITY 3	LP 1132.2	PLE PIN A3	
LU 1659	PLA PIN 24	CHANNEL IDENTITY 4	LP 1132.2	PLE PIN A4	
LU 1659	PLA PIN 25	NOT USED			

Diagram 2. LU 1659 - LP 1132.2 Interconnecting Cable Details.

Diagram 2. (Cont.)

FROM		SERVICE	TO	
LU 1659	PLA PIN 26	CHANNEL IDENTITY 5	LP 1132.2	PL E PIN A5
LU 1659	PLA PIN 27	CHANNEL IDENTITY 6	LP 1132.2	PL E PIN A6
LU 1659	PLA PIN 28	CHANNEL IDENTITY 7	LP 1132.2	PL E PIN A7
LU 1659	PLA PIN 29	CHANNEL IDENTITY 8	LP 1132.2	PL E PIN A8
LU 1659	PLA PIN 30	CHANNEL IDENTITY 9	LP 1132.2	PL E PIN A9
LU 1659	PLA PIN 31	CHANNEL IDENTITY 10	LP 1132.2	PL E PIN B1
LU 1659	PLA PIN 32	CHANNEL IDENTITY 20	LP 1132.2	PL E PIN B2
LU 1659	PLA PIN 33	CHANNEL IDENTITY 30	LP 1132.2	PL E PIN B3
LU 1659	PLA PIN 34	CHANNEL IDENTITY 40	LP 1132.2	PL E PIN B4
LU 1659	PLA PIN 35	CHANNEL IDENTITY 50	LP 1132.2	PL E PIN B5
LU 1659	PLA PIN 36	CHANNEL IDENTITY 60	LP 1132.2	PL E PIN B6
LU 1659	PLA PIN 37	CHANNEL IDENTITY 70	LP 1132.2	PL E PIN B7
LU 1659	PLA PIN 38	CHANNEL IDENTITY 80	LP 1132.2	PL E PIN B8
LU 1659	PLA PIN 39	CHANNEL IDENTITY 90	LP 1132.2	PL E PIN B9
LU 1659	PLA PIN 40	SIGNAL HI	LP 1243 a LP 1243 b	SKTA PIN A
LU 1659	PLA PIN 41	SIGNAL LO	LP 1243 a LP 1243 b	SKTA PIN B
LU 1659	PLA PIN 42	SCREENING	LP 1243 a LP 1243 b	SKTA PIN C
LU 1659	PLA PIN 43	DIGITISE COMMAND (CR PIN C-PLJ)	LP 1132.2	PL J PIN E
LU 1659	PLA PIN 44	-12 V	LP 1243 a LP 1243 b	SKTB PIN B
LU 1659	PLA PIN 45	C.R.	LP 1243 a LP 1243 b	SKTB PIN A
LU 1659	PLA PIN 46	END OF SCAN	LP 1132.2	PL F PIN D5
LU 1659	PLA PIN 47	EXTERNAL (CLOCK) START	LP 1132.2	PL J PIN A
LU 1659	PLA PIN 48	CHANNEL IDENTITY 00	LP 1132.2	PL E PIN B10
LU 1659	PLA PIN 49	INHIBIT SCAN	LP 1132.2	PL F PIN C7

TECHNICAL DESCRIPTION

3.1 General

The unit converts decimal (one-out-of-'n' code) channel identity signals, generated by the LP 1132.2 Scanner, to BCD form. It also routes a maximum of 100 function outputs from the LP 1243 Relay Units, associated with the Scanner, to a Compact Logger system Pin Board; specified groups of five outputs being fed in channel order to one column of the Pin Board.

Facilities are provided to transfer the Scanner input and digitise command signals to the system A-D Converter; to route start scan signals from a Digital Clock LU 1463 and from a Typewriter Drive LU 1469 to the Scanner; to supply end of scan signals to output devices for recording purposes and to command typewriter carriage return; to connect offset voltages from the Thermometer Bridge LU 1462 or Thermocouple Unit LU 1468 to the system A-D Converter.

3.2 Circuit Details (Diagram 3).

3.2.1 Channel Identity

Two decades (units and tens) of channel identity signals are presented to the diode matrix on printed circuit board 16599002 in decimal 'one-out-of-n' code. Outputs from the matrices take the form of the BCD (8421 code) equivalent of the decimal input. For example, when pin 27, SKTA is energised at -12V to indicate that the Scanner LP 1132.2 is sampling channel 6, the BCD output from the tens decade is 0000 on pins 14, 22, 21 and 15 (PCB 1659002) and the BCD output from the units decade on pins 1, 8, 7 and 2 (PCB 1659002) is 0110.

Decimal	B C D			
	8	4	2	1
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1

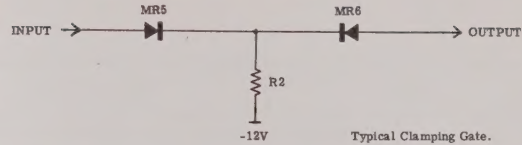
Table 4. Truth Table BCD - Decimal (0-9)

3.2.2 Carriage Return

Channel identity 'tens' information is fed to a series of diode gates on board 16599001 which detect every tenth, twentieth or fiftieth channel, depending upon the position of switch SA.

Each gate, e.g. MR5, MR6, R2, functions

in the following manner.



Normally, a voltage level at common rail (approximately 0V) potential is applied to the anode of MR5. The junction of MR5, MR6 and R2 is therefore maintained at common rail and MR6 is cut off. When a -10V channel identity signal is applied to the anode of MR5, the junction of the three components is unclamped, allowing MR6 to conduct through R2 and supply an input to switch SA.

The selected output from the switch is taken to the junction of MR3 and MR4. When a channel identity units 09 signal is applied to the anode of MR3, an output is developed across R1 on board 16599001. This is a.c. coupled to an NPN inverter VT1 on board 16599003 to prevent spurious negative voltage spikes, developed in the ring counters of the Scanner LP 1132.2, from triggering the carriage return bistable in the Typewriter Drive LU 1469. When a true switch output occurs, it is differentiated by C1, R1 on board 16599003 and its positive going trailing edge is amplified by VT1. The resulting pulse is then fed to VT2 which superimposes it as a positive pulse on the 'End of Scan' (Final Channel Selected) line connected to pins AA and z, SKTB. This applies a trigger input to the carriage return bistable in the Typewriter Drive LU 1469 without affecting the change-over circuits in the Punch Drive units.

Thus, carriage return occurs on completion of the sampling of channels 09, 19, 29 etc., for every 10 channels and of channels 19, 39, 59 etc., for every 20 channels. In the '50' position of switch SA, channel identity signals 09 and 40 develop an output across R1 (board 16599001) to produce carriage return.

Inverters VT3, VT4 (board 16599003) increase the power of the 'End of Scan' pulse developed in the Scanner LP 1132.2. The Scanner may reset itself after any limited number of channels have been sampled. Consequently, an 'End of Scan' signal would be required on such occasions.

An 'End of Scan' signal is also provided after TIME information has been recorded. The signal is generated by triggering a monostable VT5, VT6 on board 16599003 with the START SCAN pulse from the Digital Clock LU 1463.

The monostable output is inverted by VT7 and the positive pulse produced by the transistor is superimposed on the 'End of Scan' line. Monostable delay is necessary because the TIME change-over inverters in the output drive units have to operate before the carriage return bistable is triggered. With no delay, the carriage return bistable operates while its output to the drive unit serialising ring is still clamped, and a 'lock-out' state results.

3.2.3 System Pin Board Call Up

The system pin board is called up by means of the closure of the third contact of each relay in the Relay Units LP 1243 (A and B) incorporated the Scanner LP 1132.2. The 100 available outputs are paralalled up in sets of five in the loom between the LP 1132.2 and the LU 1659. Thus, column 00 on the pin board is controlled by channels 00, 20, 40, 60 and 80; column 01 is controlled by channels 01, 21, 41, 61 and 81; the sequence continuing to column 19 and channels 19, 39, 59, 79 and 99. This arrangement may be altered if required. It is suggested that when Thermocouple Compensating Units type LU 1468 are used in a system, the call up arrangements be altered so that column 00 is controlled by channels 00, 01, 02, 03 and 04 and that column 01 is controlled by channels 05, 06, 07, 08 and 09, the sequence continuing to column 19 and channels 95, 96, 97, 98 and 99.

3.2.4 Offset Supplies

Relays RLA-RLE are operated by the Scanner LP 1132.2 function outputs to provide a selection of offset supplies from a maximum of five Thermocouple Compensating Units LU 1468.

Additionally, relays RLF and RLG are used to inject offset supplies from the Thermometer Bridge units LU 1462.

3.2.5 Power Supplies

Mains transformer T1 incorporates two 0V to 115V primary windings which may be connected in series or in parallel by means of MSP1 for 230V or 115V operation.

Two full wave rectifying circuits are driven from the secondary windings to provide unregulated +12V and -12V supplies.

SECTION 4

TEST PROCEDURE

4.1 Introduction

The procedure given in this section is basically the production test to which all units are subjected prior to despatch. It is provided to enable the user to confirm the performance of the unit and to make any necessary adjustments.

4.2 Equipment

- (a) Multi-Range Test Meter, 20000ΩV.
- (b) Double-Beam Oscilloscope - Solartron CD 1014.2 or similar.
- (c) Low Frequency Pulse Generator.
- (d) Power Supply to give -12V d.c.

4.3 Access

Release the free connectors and remove the wing nut at the rear of the module. Ease the module out of its cabinet and position it in a convenient test position. A three-lead cable with suitable connectors will be required for the power supply.

Release the two holding screws on the right-hand side panel of the module (viewed from the front) and lower the panel. The printed circuit boards may now be hinged out for servicing.

4.4 Test Sequence

- (a) Set the mains selector MSP1 to the position corresponding to the mains supply. Connect the module to the mains supply.
- (b) On board 16599001, check between pins 4 and 10 for +12V. The rail supplies are unregulated and should be ±10% at nominal mains voltage.
- (c) Apply -12V to each of pins 21 to 39 on Socket SKTA in turn and check that the correct BCD output appears on the appropriate pins on socket SKTB.
- (d) Check the operation and continuity of relays RLA-RLE by applying -12V to pins 1-20 on socket SKTA.
- (e) Apply -12V to pin 46 socket SKTA and check that the output from pins AA and z on socket SKTB is now at -12V.
- (f) Set the CARRIAGE RETURN switch to 10. Apply -12V to pin 31, socket SKTA and a negative going 12V pulse of minimum duration 100 msecs. to pin 30 socket SKTA. Check that a 12V positive going pulse appears on pins AA and z socket SKTB coincident with the positive going edge of the applied pulse. This should be done with no input on pin 46 socket SKTA so that the output pulse goes positive from common rail.
- (g) Repeat (f) with -12V applied in turn to pins 32, 33, 34, 35, 36, 37, 38 and 39, socket SKTA.
- (j) Set the CARRIAGE RETURN switch to 50. Apply -12V to pin 34, socket SKTA and repeat (f).
- (k) Apply a 10V positive pulse to pin DD on socket SKTB and check that a positive 12V pulse appears on pins AA and z, socket SKTB. The output pulse should be delayed by 5msecs. ±1msec.
- (l) Apply -12V to pins u and v, socket SKTB. Check the functioning of, and con-

COMPONENTS LIST

for

Printed Circuit Board No. 16599002

Cct. Ref.	General Description	Solartron Part No.
MR1 to MR50	OA91 Mullard	300520070

Accessories

Connector Free 20 Way	351920010
Type 'DM' Housing	354000610
Strain Relief Clamp	354000640
Jackscreen Turnable Male (Long)	354000690
Jackscreen Turnable Female (Long)	354000700
Pin Loose Piece 24-20 Tin	354000560

COMPONENTS LIST

for

Printed Circuit Board No. 16599003

Cct. Ref.	General Description	Solartron Part No.
R1	X 47K $\frac{1}{4}$ W 10%	172344700
R2	X 1K $\frac{1}{4}$ W 10%	172331000
R3	X 330K $\frac{1}{4}$ W 10%	172353300
R4	X 3.3K $\frac{1}{4}$ W 10%	172333300
R5	X 10K $\frac{1}{4}$ W 10%	172341000
R6	X 100 $\frac{1}{4}$ W 10%	172321000
R7	X 1.2K $\frac{1}{4}$ W 10%	172331200
R8	X 68K $\frac{1}{4}$ W 10%	172346800
R9	X 18K $\frac{1}{4}$ W 10%	172341800
R10	X 3.3K $\frac{1}{4}$ W 10%	172333300
R11	X 47K $\frac{1}{4}$ W 10%	172344700
R12	X 4.7K $\frac{1}{4}$ W 10%	172334700
R13	X 10K $\frac{1}{4}$ W 10%	172341000
R14	X 68K $\frac{1}{4}$ W 10%	172346800
R15	X 3.3K $\frac{1}{4}$ W 10%	172333300
R16	X 33K $\frac{1}{4}$ W 10%	172343300
R17	X 100K $\frac{1}{4}$ W 10%	172351000
R18	X 3.3K $\frac{1}{4}$ W 10%	172333300
R19	X 10K $\frac{1}{4}$ W 10%	172341000
R20	X 100 $\frac{1}{4}$ W 10%	172321000
C1	M. Po 0.47 125V 20%	220454700
C2	M. Po 0.47 125V 20%	220454700
C3	Po 0.01 125V 20%	221441000
C4	Po 560p 125V 10%	210225600
C5	M. Po 0.1 125V 20%	220451000
C6	M. Po 0.1 125V 20%	220451000
MR1	OA91 Mullard	300520070
VT1	XK505 S.T.C.	300551650
VT2	MM2614 Motorola	300551940
VT3	ACY20 Mullard	300550680
VT4	ACY20 Mullard	300550680
VT5	ACY20 Mullard	300550680
VT6	ACY20 Mullard	300550680
VT7	MM2614 Motorola	300551940

COMPONENT PARTS LIST

Abbreviations.

Circuit References

R	=	Fixed Resistor (Ω)	
RV	=	Variable Resistor (Ω)	
C	=	Capacitor (μF)	
V	=	Valve	
VT	=	Transistor	BY = Battery
MR	=	Diode	LK = Link
S	=	Switch	M = Meter
SKT	=	Socket	
PL	=	Plug	
T	=	Transformer	
L	=	Inductor	
FS	=	Fuse	
RL	=	Relay	
TP	=	Terminal	
MSP	=	Main Selector Panel	
ILP	=	Lamp	

Components

W	=	Resistor Composition > 5% Insulated = > Grade 1
X	=	Resistor Composition < 5% Insulated = < Grade 2
Y	=	Resistor Wire Wound
Z	=	Resistor Oxide Film < 5% Insulated = < Grade 2
E	=	Electrolytic
M	=	Mica
Pa	=	Paper
Pl	=	Metalised Plastic
Ce Var	=	Ceramic Trimmer
Po	=	Polyester Foil Ins.
M. Po	=	Metalised Polyester Ins.
Ce	=	Ceramic
Lin	=	Linear
Log	=	Logarithmic
H	=	Henrys

- tinuity of wiring on, relays RLF and RLG.
- (m) Check the continuity between:-
 Socket SKTA pin 40 and Socket SKTB pin A.
 Socket SKTA pin 40 and Socket SKTB pin B.

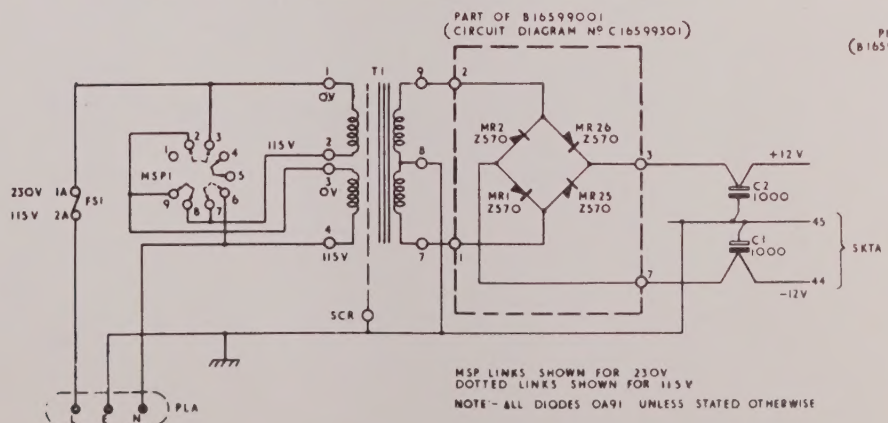
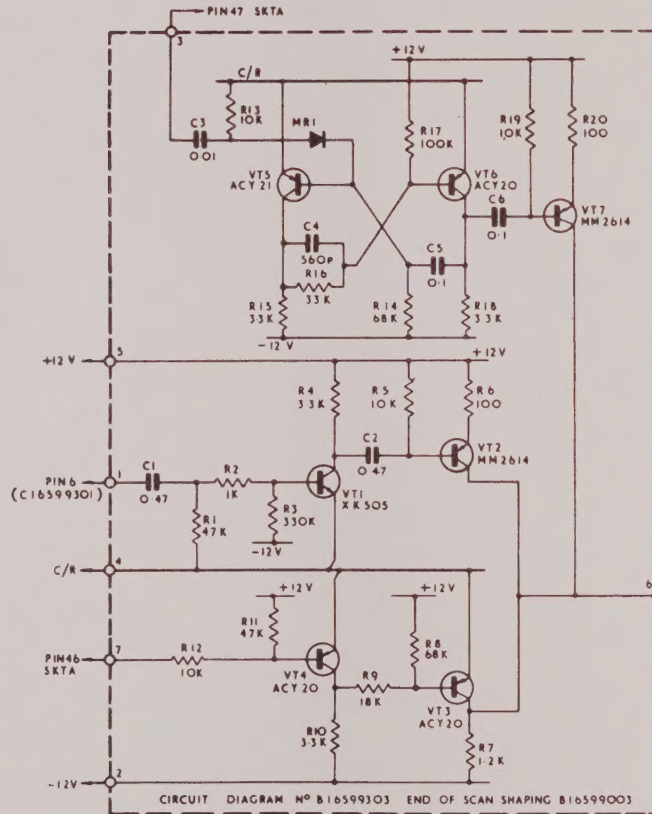
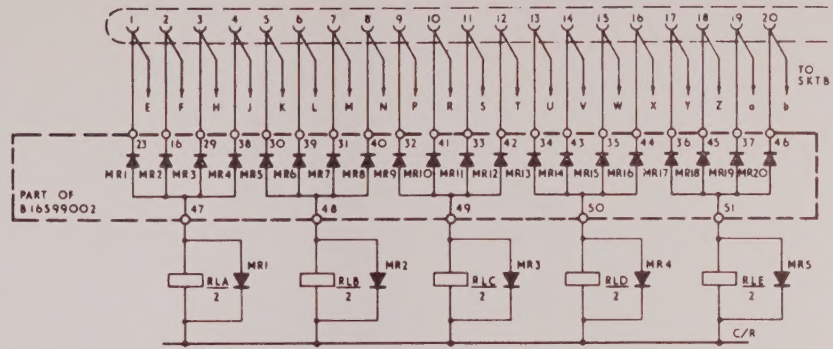
Socket SKTA pin 42 and Socket SKTB pin C.
 Socket SKTA pin 43 and Socket SKTB pin W, X, Y.
 Socket SKTA pin 49 and Socket SKTB pin CC.

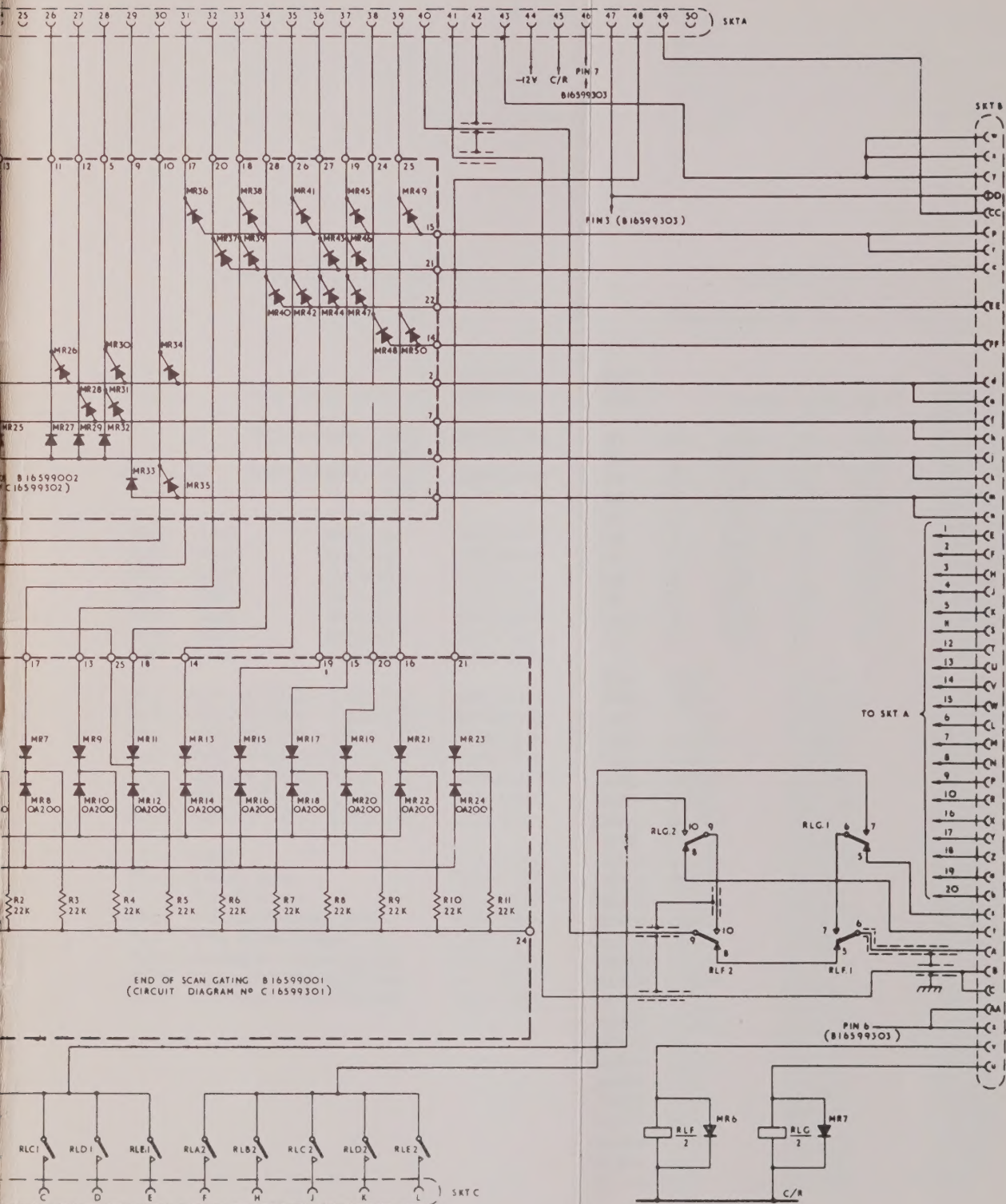
COMPONENTS PARTS LIST
 for
 LU1659 Main Unit

COMPONENTS LIST
 for
 Printed Circuit Board No.16599001

Cct. Ref.	General Description		Solartron Part No.
C1	E	1000 μ F 25V -20% +100	260791000
C2	E	1000 μ F 25V -20% +100	260791000
MR1	OA91	Mullard	300520070
MR2	OA91	Mullard	300520070
MR3	OA91	Mullard	300520070
MR4	OA91	Mullard	300520070
MR5	OA91	Mullard	300520070
MR6	OA91	Mullard	300520070
MR7	OA91	Mullard	300520070
RLA	RELAY VP 2 - CAB - 13		300650470
RLB	RELAY VP 2 - CAB - 13		300650470
RLC	RELAY VP 2 - CAB - 13		300650470
RLD	RELAY VP 2 - CAB - 13		300650470
RLE	RELAY VP 2 - CAB - 13		300650470
RLF	RELAY VP 2 - CAB - 13		300650470
RLG	RELAY VP 2 - CAB - 13		300650470
SA	Switch		373104030
FS	Fuse 1 amp		360101300
T1	Transformer		301050250
MSP1	Voltage Selector Panel		399000060
PLA	Plug Fixed 3-way		352303030
SKTA	Connector Fixed 50-way		352550020
SKTB	Connector Fixed 50-way		352550070
SKTC	Connector Fixed 20-way		352920030

Cct. Ref.	General Description			Solartron Part No.
R1	X	33K	$\frac{1}{4}$ W 10%	172343300
R2	X	22K	$\frac{1}{4}$ W 10%	172342200
R3	X	22K	$\frac{1}{4}$ W 10%	172342200
R4	X	22K	$\frac{1}{4}$ W 10%	172342200
R5	X	22K	$\frac{1}{4}$ W 10%	172342200
R6	X	22K	$\frac{1}{4}$ W 10%	172342200
R7	X	22K	$\frac{1}{4}$ W 10%	172342200
R8	X	22K	$\frac{1}{4}$ W 10%	172342200
R9	X	22K	$\frac{1}{4}$ W 10%	172342200
R10	X	22K	$\frac{1}{4}$ W 10%	172342200
R11	X	22K	$\frac{1}{4}$ W 10%	172342200
MR1	ZS70	Ferranti		300521110
MR2	ZS70	Ferranti		300521110
MR3	OA91	Mullard		300520070
MR4	OA200	Mullard		300520720
MR5	OA91	Mullard		300520070
MR6	OA200	Mullard		300520720
MR7	OA91	Mullard		300520070
MR8	OA200	Mullard		300520720
MR9	OA91	Mullard		300520070
MR10	OA200	Mullard		300520720
MR11	OA91	Mullard		300520070
MR12	OA200	Mullard		300520720
MR13	OA91	Mullard		300520070
MR14	OA200	Mullard		300520720
MR15	OA91	Mullard		300520070
MR16	OA200	Mullard		300520720
MR17	OA91	Mullard		300520070
MR18	OA200	Mullard		300520720
MR19	OA91	Mullard		300520070
MR20	OA200	Mullard		300520720
MR21	OA91	Mullard		300520070
MR22	OA200	Mullard		300520720
MR23	OA91	Mullard		300520070
MR24	OA200	Mullard		300520720
MR25	ZS70	Ferranti		300521110
MR26	ZS70	Ferranti		300521110





D16597001

100 CHANNEL CONVERTER
CIRCUIT DIAGRAM

MP MASTER



MA24421